

CLAIMS

What is claimed is:

1. A flexographic printing form comprising
 - a) a support, and
 - 5 b) at least one elastomeric layer on the support having a top surface containing an imagewise printing relief, wherein the top surface also contains in a non-image area a print control element comprising relief elements with defined height differences.
2. The flexographic printing form of Claim 1 wherein the print
10 control element comprises at least two relief elements of defined height difference.
3. The flexographic printing form of Claim 1 wherein the print control element comprises at least three relief elements of defined height difference with a center element of defined height and the elements of
15 both sides having the same defined height differences compared to the center element.
4. The flexographic printing form of Claim 3 wherein the print control element is a bar code.
5. The flexographic printing form of Claim 1 wherein the
20 elastomeric layer is formed from a photopolymerizable layer containing at least one elastomeric binder, at least one ethylenically unsaturated compound photopolymerizable by actinic radiation, and at least one photoinitiator or photoinitiator system.
6. The flexographic printing form of Claim 5 wherein an integrated
25 IR-sensitive layer is disposed on the top surface for use as a photomask.
7. The flexographic printing form of Claim 6 further comprising at least one additional layer disposed between the IR-sensitive layer and the top surface wherein the additional layer is being selected from the group consisting of an elastomeric layer capable of becoming photosensitive, a
30 release layer and a wax layer.
8. The flexographic printing form of Claim 5 further comprising at least one additional layer disposed on the top surface wherein the additional layer is selected from the group consisting of an elastomeric layer capable of becoming photosensitive, a release layer and a wax
35 layer.
9. The flexographic printing form of Claim 8 wherein the release layer comprises at least one matting agent capable of being anchored in the surface of the photopolymerizable layer.

10. A process for preparing a flexographic printing form containing an imagewise printing relief comprising:

providing at least one elastomeric layer having a top surface adapted to contain an imagewise printing relief; and

5 forming in a non-image area of the elastomeric layer a print control element comprising relief elements with defined height differences.

11. The process of Claim 10 wherein the elastomeric layer comprises a photopolymerizable layer containing at least one elastomeric binder, at least one ethylenically unsaturated compound

10 photopolymerizable by actinic radiation, and at least one photoinitiator or photoinitiator system, the process further comprising:

A) exposing the photopolymerizable layer to actinic radiation through a photomask forming polymerized areas and unpolymerized areas in the photopolymerizable layer,

15 B) removing the photomask, and

C) removing unpolymerized areas to form in the top surface of the photopolymerizable layer the imagewise printing relief and the print control element.

12. The process of Claim 11 wherein the forming step is performed
20 by impressing a negative matrix of the print control element comprising relief elements with defined height differences into the top surface of the photopolymerizable layer.

13. A flexographic printing form produced by the process of Claim 12.

25 14. The process of Claim 11 wherein an integrated infrared sensitive ablation layer is disposed on the top surface, the process further comprising the step of imagewise exposing the infrared sensitive layer to infrared laser radiation to form both the photomask and a high resolution pattern capable of filtering actinic radiation during the exposing step to
30 form the print control element.

15. A flexographic printing form produced by the process of Claim 14.

16. The process of Claim 11 where the step B) of removing the photomask is performed during step C).

35 17. The process of Claim 11 wherein the removing step C) is selected from the group consisting of

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- (1) developing with at least one washout solution selected from the group consisting of solvent solution, aqueous solution, semi-aqueous solution, and water; and
 - (2) heating the photopolymerizable layer to a temperature sufficient to cause the unpolymerized portions to melt, flow, or soften, and contacting the photopolymerizable layer with an absorbent material to remove the unpolymerized portions.
- 10 18. The process of Claim 10 wherein the elastomeric layer comprises a laser-engravable, reinforced elastomeric layer, the process further comprising:
- A) imagewise ablating the laser-engravable, reinforced elastomeric layer to form the printing relief, and
 - 15 B) forming the print control element by ablating the non-image area of the elastomeric layer to provide the relief elements with defined height differences.
18. 19. A flexographic printing form produced by the process of Claim 18.

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